THE

GEOLOGICAL MAGAZINE

VOL. XCI OF WHOLE SERIES

JANUARY–DECEMBER, 1954

GEOLOGICAL MAGAZINE

with which is incorporated

THE GEOLOGIST

FOUNDED IN 1864 BY THE LATE DR. HENRY WOODWARD, F.R.S.

Edited by

O. M. B. BULMAN, Ph.D., A.R.C.Sc., F.R.S.

and

S. R. NOCKOLDS, Ph.D.

assisted by

PROFESSOR W. G. FEARNSIDES, M.A., F.R.S.
PROFESSOR LEONARD HAWKES, D.Sc., F.R.S.
PROFESSOR O. T. JONES, M.A., D.Sc., F.R.S.
PROFESSOR W. J. PUGH, O.B.E., D.Sc., F.R.S.
PROFESSOR C. E. TILLEY, Ph.D., F.R.S.

Vol. XCI of Whole Series
JANUARY—DECEMBER, 1954

STEPHEN AUSTIN & SONS, LTD
CAXTON HILL, WARE ROAD, HERTFORD, HERTS

HERTFORD

STEPHEN AUSTIN AND SONS, LTD.

CONTENTS OF VOLUME XCI, 1954

No. 1 JANUARY–FEBRUARY PAGE

T. C. PHEMISTER and D. H. WILLIAMSON. "Flattening" in Dalradian Quartz-Schist north of Stonehaven, Kincardineshire . . . 1
A. KINGSLEY WELLS. Mugearites and Oligoclase-basalts . . . 14
R. J. MURRAY. The Clinopyroxenes of the Garbh Eilean Sill, Shiant Isles . . . 17
G. M. BENNISON. A New Species of *Carbonicola* from near the Base of the Namurian in Ayrshire . . . 32
K. A. JOYSEY. The Structure of the Plastron of the Echinoid *Somaliaster* Hawkins . . . 45
P. GILMOUR and MAX F. CARMAN. Petrofabric Analyses of the Loch Tay Limestone from Strachur, Argyll . . . 49
O. F. TUTTLE and M. L. KEITH. The Granite Problem: Evidence from the Quartz and Feldspar of a Tertiary Granite . . . 61
E. B. BAILEY. Relations of Torridonian to Durness Limestone in the Broadford–Strollamus district of Skye . . . 73
W. T. HARRY. The Clinopyroxene-hornblende Equilibrium in Thermal Metamorphism: Some Data from Carlingford, Eire . . . 79
CORRESPONDENCE.—"Hutton's Unconformity", 85.
REVIEWS.—Geologie der Schweizer Alpen, 86; Geology of Australian Ore Deposits, 87.
PUBLICATIONS RECEIVED.—88.

No. 2 MARCH–APRIL

J. B. AUDEN. Erosional Patterns and Fracture Zones in Peninsular India . . . 89
W. A. CUMMINS. An Arenig Volcanic Series near Charlestown, Co. Mayo . . . 102
E. B. BAILEY. Contact of Tertiary Lavas with Torridonian near Broadford, Skye . . . 105
G. P. LEEDAL and G. P. L. WALKER. Tear Faults in the Barnesmore area, Donegal . . . 116
R. H. CLARK. A Study of Calcite Twinning in the Strathavon Marble, Banffshire . . . 121
R. I. HARKER. The Occurrence of Orthoclase and Microcline in the Granitic Gneisses of the Carn Chuinneag–Inchbae Complex, E. Ross-shire . . . 129
M. S. SADASHIVAIAH. The Form of the Eastern End of the Insch Igneous Mass, Aberdeenshire . . . 137
L. D. SANDERS. The Status of Sillimanite as an Index of Metamorphic Grade in the Kenya Basement System . . . 144
F. HODSON. The Carboniferous Rocks of Foynes Island, County Limerick . . . 153
P. C. GILMOUR and D. B. MCINTYRE. The Geometry of the Ben Lui Fold (S.W. Highlands) . . . 161
J. WRIGHT. *Idosocrinus* gen. nov. and other Crinoids from Thornton Burn, East Lothian . . . 167
J. MYERS. On the Occurrence of *Anthraconauta tenuis* (Davies and Trueman) in North Staffordshire . . . 171
CORRESPONDENCE.—Lugeon's Unpublished Interpretation of the Strath Oykell Mullions, 174; Rules of Nomenclature, 174; Comments on the Caribbean Oligocene, 175.
PUBLICATIONS RECEIVED.—176.

No. 3 MAY–JUNE PAGE

F. SMITHSON and G. BROWN. The Petrography of Dickitic Sandstones in North Wales and Northern England 177
G. BOND. Lamellibranchia and Plants from the Lower Karroo Beds of Northern Rhodesia 189
C. T. TRECHMANN. Thrusting and other movements in the Durham Permian 193
W. PULFREY. Alkaline Syenites at Ruri, South Nyanza, Kenya . . 209
T. M. THOMAS. Solution Subsidence Outliers of Millstone Grit on the Carboniferous Limestone of the North Crop of the South Wales Coalfield 220
J. D. LAWSON. The Silurian Succession at Gorsley (Herefordshire) 227
E. S. W. SIMPSON. On the Graphical Representation of Differentiation Trends in Igneous Rocks. 238
T. U. JOHN and K. L. PAULO. A Note on the Occurrence of Columbite in the Younger Granites of the Jos Plateau, Nigeria . . . 245
J. M. HANCOCK. A New Ampthill Clay Fauna from Knapwell, Cambridgeshire 249
P. M. KIER. A New *Palaeechinus* from Alberta 252
CORRESPONDENCE.—The Strollamus Area of Skye, 255.

No. 4 JULY–AUGUST

G. P. BLACK. The Acid Rocks of Western Rhum 257
K. F. G. HOSKING. The Pegmatites of Trolvis Quarry, Carnmenellis, Cornwall 273
M. S. SADASHIVAIAH. The Granite-Diorite Complex of the Insch Igneous Mass, Aberdeenshire 286
M. K. WELLS. The Structure of the Granophyric Quartz-Dolerite Intrusion of Centre 2, Ardnamurchan, and the Problem of Net-Veining 293
W. S. PITCHER, D. J. SHEARMAN, and D. C. PUGH. The Loess of Pegwell Bay, Kent, and its Associated Frost Soils . . . 308
J. T. TEMPLE. The Hypostome of *Encrinurus variolaris* and its Relation to the Cephalon 315
R. N. COPE. Cyrtograptids and Retiolitids from County Tipperary . 319
CORRESPONDENCE.—Rules of Nomenclature, 325; The Caribbean "Oligocene", 326.
REVIEWS.—Mountain Building, 327; The Coalfields of Great Britain, 331; Geology and Scenery in Britain, 333; Minerals for the Chemical and Allied Industries, 334; Clay Mineralogy, 335; The Soils of Europe, 336.

No. 5 SEPTEMBER–OCTOBER

J. B. AUDEN. Drainage and Fracture Patterns in North-West Scotland 337
J. HOSPERS. Magnetic Correlation in Volcanic Districts . . . 352
P. K. SUTHERLAND. New Genera of Carboniferous Tetracorals from Western Canada 361
G. F. S. HILLS. The Distribution of Radioactivity with Depth in the Continents 372
M. H. P. BOTT. Interpretation of the Gravity Field of the Eastern Alps 377
T. BARNARD. *Hantkenina alabamensis* Cushman and Some Related Forms 384
J. SUTTON and J. WATSON. Ice-Borne Boulders in the Macduff Group of the Dalradian of Banffshire 391
M. S. AMIN. Notes on the Ultrabasic Body of Unst, Shetland Islands 399

PAGE

CORRESPONDENCE.—On the Occurrence of Linnaeite in the Coal Measures of South Wales, 407; Angle Between the Principal Horizontal Stress and Transcurrent Faults, 407; Minerals for the Chemical and Allied Industries, 408; Proposed Neotype for *Pleurotomaria anglica* (J. Sowerby), 409; Rules of Nomenclature, 410; The Miocene/Oligocene Boundary in the Caribbean Region, 410.

REVIEWS.—Geochemistry, 415; Petrography, 416.

No. 6 NOVEMBER–DECEMBER

D. L. REYNOLDS and A. HOLMES. The Superposition of Caledonoid Folds on an Older Fold-System in the Dalradians of Malin Head, Co. Donegal 417

R. I. HARKER. Further Data on the Petrology of the Pelitic Hornfelses of the Carn Chuinneag–Inchbae Region, Ross-shire, with Special Reference to the Status of Almandine 445

G. P. L. WALKER and J. V. ROSS. A Xenolithic Monchiquite Dyke 463

R. L. OLIVER. Welded Tuffs in the Borrowdale Volcanic Series, English Lake District, with a Note on Similar Rocks in Wales 473

A. R. GINDY. The Plutonic History of the Aswan Area, Egypt . . 484

P. ALLEN. Geology and Geography of the London–North Sea Uplands in Wealden Times 498

I. STRACHAN. The Structure and Development of *Peiragraptus fallax*, gen. et sp. nov. A new Graptolite from the Ordovician of Canada 509

C. W. DROOGER. The Oligocene-Miocene Boundary on both sides of the Atlantic 514

CORRESPONDENCE.—The Usk Monchiquite—A "Pipe Intrusion", 519; The Great Glen Fault, Co. Donegal, 519.

REVIEWS.—Oil in the Middle East, 520; Albert Heim. Leben und Forschung, 520.

PUBLICATIONS RECEIVED.—522.

INDEX.—525.

INDEX

[R] indicates Review article

ACID Rocks of Western Rhum, G. P. Black, 257.
Alkaline Syenites at Ruri, Kenya, W. Pulfrey, 209.
Allen, P., South-East England in Wealden Times, 498.
Amin, M. S., Notes on the Ultrabasic Body of Unst, Shetland, 399.
Ampthill Clay Fauna, New, J. M. Hancock, 249.
Anderson, J. G. C., "Hutton's Unconformity," 85.
Anthraconauta tenuis in N. Staffs, J. Myers, 171.
Arenig Volcanic Series near Charlestown, Co. Mayo, W. A. Cummins, 102.
Arkell, W. J., Rules of Nomenclature, 174, 410.
Aswan Area, Plutonic history of, A. R. Gindy, 484.
Auden, J. B., Drainage and Fracture Patterns in N.W. Scotland, 337.
—— Erosional Patterns and Fracture Zones in Peninsular India, 89.
Australian Ore Deposits, Geology of, A. B. Edwards (ed.), [R] 87.

BAILEY, Sir E. B., Contact of Tertiary Lavas with Torridonian, 105.
—— Relations of Torridonian to Durness Limestone, 73.
Barnard, T., *Hantkenina alabamensis* Cushman and Some Related Forms, 384.
Bemmelen, R. W. Van, Mountain Building, [R] 327.
Bennison, G. M., A New Species of *Carbonicola*, 32.
Black, G. P., The Acid Rocks of Western Rhum, 257.
Bond, G., Lamellibranchia and Plants from N. Rhodesia, 189.
Bott, M. H. P., Gravity Field of the Eastern Alps, 377.
Brockmann-Jerosch, A. and H. Heim. Albert Heim. Leben und Forschung, [R] 520.
Brown, G., *see* Smithson, F.

CADISCH, J., Geologie der Schweizer Alpen, [R] 86.
Calcite Twinning in the Strathavon Marble, R. H. Clark, 121.
Caledonoid Folds in the Dalradians of Malin Head, Co. Donegal, D. L. Reynolds and A. Holmes, 417.
Canadiphyllum knoxi gen. et sp. nov., 361.
Carbonicola, New Species from Ayrshire, G. M. Bennison, 32.
Carboniferous Corals, New, P. K. Sutherland, 361.
Carboniferous Rocks of Foynes Island, F. Hodson, 153.
Caribbean Oligocene, R. M. Stainforth, 175; F. E. Eames, 326; H. G. Kugler, 410.
Carman, M. F., *see* Gilmour, P.
Cheesman, R. L., *see* Dowling, J. W. F.
Clark, R. H., Calcite Twinning in the Strathavon Marble, 121.
Clay Mineralogy, R. E. Grim, [R] 335.
Clinopyroxene - hornblende Equilibrium in Thermal Metamorphism, W. T. Harry, 79.
Clinopyroxenes of the Garbh Eilean Sill, R. J. Murray, 17.
Coalfields of Britain, Sir A. Trueman, [R] 331.
Columbite, Nigeria, Occurrence of, T. U. John and K. L. Paulo, 245.
Cope, R. N., Graptolites from Co. Tipperary, 319.
Cox, A. H., The Usk Monchiquite—A "Pipe Intrusion", 519.
—— L. R., Proposed Neotype for *Pleurotomaria anglica* (J. Sowerby), 409.
Crinoids from Thornton Burn, J. Wright, 167.
Cummins, W. A., Arenig Volcanic Series near Charlestown, Co. Mayo, 102.

DALRADIAN, Ice-borne boulders in, J. Sutton and J. Watson, 391.
—— Quartz-Schist, "Flattening" in, T. C. Phemister and D. H. Williamson, 1.
Dickitic Sandstones, the Petrography of, F. Smithson and G. Brown, 177.
Differentiation Trends, representation of, E. S. W. Simpson, 238.

Dowling, J. W. F., R. M. Shackleton, W. S. Pitcher, R. L. Cheesman, and H. H. Read, Great Glen Fault, Co. Donegal, 519.
Drainage and Fracture Patterns in N.W. Scotland, J. B. Auden, 337.
Drooger, C. W., Oligocene-Miocene Boundary, 514.
Durham Permian, Thrusting in the, C. T. Trechmann, 193.

EAMES, F. E., The Caribbean "Oligocene", 326.
Edwards, A. B. (ed.), Geology of Australian Ore Deposits, [R] 87.
Encrinurus variolaris, Hypostome of, J. T. Temple, 315.
Erosional Patterns and Fracture Zones in Peninsular India, J. B. Auden, 89.

GARBH Eilean Sill Clinopyroxenes, R. J. Murray, 17.
Geochemistry, V. M. Goldschmidt (ed. A. Muir), [R] 415.
Geologie der Schweizer Alpen, J. Cadisch, [R] 86.
Geology and Scenery in Britain, T. G. Miller, [R] 333.
Geometry of the Ben Lui Fold, P. C. Gilmour and D. B. McIntyre, 161.
Gilbert, C., *see* Williams, H.
Gilmour, P., and Carman, M. F., Petrofabric Analyses of the Loch Tay Limestone, 49.
—— and McIntyre, D. B., Geometry of the Ben Lui Fold, 161.
Gindy, A. R., The Plutonic History of the Aswan Area, Egypt, 484.
Goldschmidt, V. M. (ed. A. Muir), Geochemistry, [R] 415.
Granite-Diorite Complex of the Insch Igneous Mass, M. S. Sadashivaiah, 286.
Granite Problem, The, O. F. Tuttle and M. L. Keith, 61.
Granophyric Quartz-Dolerite of Centre 2, Ardnamurchan, M. K. Wells, 293.
Graptolite from Canada, A New, I. Strachan, 509.
Graptolites from Co. Tipperary, R. N. Cope, 319.
Gravity Field of the Eastern Alps, M. H. P. Bott, 377.
Great Glen Fault, Co. Donegal, J. W. F. Dowling, R. M. Shackleton, W. S. Pitcher, R. L. Cheesman, and H. H. Read, 519.
Grim, R. E., Clay Mineralogy, [R] 335.

HANCOCK, J. M., New Amphill Clay Fauna, 249.
Hantkenina alabamensis Cushman and Some Related Forms, T. Barnard, 384.
Harker, R. I., Orthoclase and Microcline in Granitic Gneisses, 129.
—— Pelitic Hornfelses of the Carn Chuinneag–Inchbae Region, 445.
Harry, W. T., Clinopyroxene-hornblende Equilibrium in Thermal Metamorphism, 79.
Heim, Albert: Leben und Forschung, M. Brockmann-Jerosch, A. and H. Heim [R], 520.
Hills, G. F. S., Radioactivity in the Continents, 372.
Hodson, F., Carboniferous Rocks of Foynes Island, 153.
Holmes, A., *see* Reynolds, D. L.
Hosking, K. F. G., Pegmatites of Carnmenellis, Cornwall, 273.
Hospers, J., Magnetic Correlation in Volcanic Districts, 352.
Howarth, W. E., Occurrence of Linnaeite in the Coal Measures of S. Wales, 407.
"Hutton's Unconformity," J. G. C. Anderson, 85.

ICE-BORNE Boulders of the Dalradian of Banffshire, J. Sutton and J. Watson, 391.
Idosocrinus gen. nov., 167.
—— *bispinosus* sp. nov., 167.
—— *tumidus* sp. nov., 169.
Insch Igneous Mass, Eastern End of, M. S. Sadashivaiah, 137.
—— Granite-Diorite Complex of, M. S. Sadashivaiah, 286.

JOHN, T. U., and Paulo, K. L., Occurrence of Columbite, Nigeria, 245.
Johnstone, S. J., Minerals for the Chemical and Allied Industries, [R] 334, 408.
Joysey, K. A., The Echinoid *Somaliaster* Hawkins, 45.

KAKWIPHYLLUM dux gen. et sp. nov., 365.
Keith, M. L., *see* Tuttle, O. F.
Kier, P. M., A New *Palaeechinus* from Alberta, 252.
King, B. C., The Strollamus Area of Skye, 255.

Kubiëna, W. L., The Soils of Europe, [R] 336.
Kugler, H. G., Miocene/Oligocene Boundary in the Caribbean Region, 410.

LAMELLIBRANCHIA and Plants from N. Rhodesia, G. Bond, 189.
Lawson, J. D., Silurian Succession at Gorsley (Herefordshire), 227.
Leedal, G. P., and G. P. L. Walker, Tear Faults in Donegal, 116.
Liardiphyllum hagei gen. et sp. nov., 368.
Linnaeite in the Coal Measures of S. Wales, W. E. Howarth, 407.
Loch Tay Limestone, Petrofabric Analyses of, P. Gilmour and M. F. Carman, 49.
Loess of Pegwell Bay, Kent, W. S. Pitcher, D. J. Shearman, and D. C. Pugh, 308.
Longrigg, S. H., Oil in the Middle East, [R] 520.
Lugeon's Unpublished Interpretation of the Strath Oykell Mullions, D. B. McIntyre, 174.

McINTYRE, D. B., Lugeon's Unpublished Interpretation of the Strath Oykell, Mullions, 174.
—— *see* Gilmour, P. C.
Magnetic Correlation in Volcanic Districts, J. Hospers, 352.
Miller, T. G., Geology and Scenery in Britain, [R] 333.
Minerals for the Chemical and Allied Industries, S. J. Johnstone, 334, [R] 408.
Miocene/Oligocene Boundary in the Caribbean Region, H. G. Kugler, 410.
Mountain Building, R. W. Van Bemmelen, [R] 327.
Mugearites and Oligoclase-basalts, A. Kingsley Wells, 14.
Muir, A., *see* Goldschmidt, V. M.
Murray, R. J., Clinopyroxenes of the Garbh Eilean Sill, 17.
Myers, J., *Anthraconauta tenuis* in N. Staffs, 171.

OIL in the Middle East, S. H. Longrigg, [R] 520.
Oligocene-Miocene Boundary, C. W. Drooger, 514.
Oliver, R. L., Welded Tuffs in the Borrowdale Volcanic Series, 473.
Orthoclase and Microcline in Granitic Gneisses, R. I. Harker, 129.

PALAEECHINUS from Alberta, New, P. M. Kier, 252.
—— *sprengi* sp. nov., 252.
Paulo, K. L., *see* John, T. U.
Pegmatites of Carnmenellis, K. F. G. Hosking, 273.
Peiragraptus fallax gen. et sp. nov., 509.
Pelitic Hornfelses of the Carn Chuinneag-Inchbae Region, R. I. Harker, 445.
Petrofabric analyses of Loch Tay Limestone, P. Gilmour and M. F. Carman, 49.
Petrography, H. Williams, F. J. Turner, C. Gilbert, [R] 416.
Phemister, T. C., and D. H. Williamson, "Flattening" in Dalradian Quartz-Schist, 1.
Pitcher, W. S., D. J. Shearman, and D. C. Pugh, The Loess of Pegwell Bay, Kent, 308.
——, *see* Dowling, J. W. F.
Pleurotomaria anglica (J. Sowerby), Proposed Neotype for, L. R. Cox, 409.
Publications Received, 88, 176, 522.
Pugh, D. C., *see* Pitcher, W. S.
Pulfrey, W., Alkaline Syenites at Ruri, Kenya, 209.

RADIOACTIVITY in the Continents, G. F. S. Hills, 372.
Read, H. H., *see* Dowling, J. W. F.
Reynolds, D. L., and A. Holmes, Caledonoid Folds in the Dalradians of Donegal, 417.
Ross, J. V., *see* Walker, G. P. L.
Rules of Nomenclature, W. J. Arkell, 174, 410; C. W. Sabrosky, 325.

SABROSKY, C. W., Rules of Nomenclature, 325.
Sadashivaiah, M. S., Eastern End of the Insch Igneous Mass, 137.
—— Granite-Diorite Complex, 286.
Sanders, L. D., The Status of Sillimanite, 144.
Shackleton, R. M., *see* Dowling, J. W. F.
Shearman, D. J., *see* Pitcher, W. S.

Sillimanite, The Status of, L. D. Sanders, 144.
Silurian Succession at Gorsley (Herefordshire), J. D. Lawson, 227.
Simpson, E. S. W., Representation of Differentiation Trends, 238.
Smithson, F., and G. Brown, The Petrography of Dickitic Sandstones, 177.
Soils of Europe, W. L. Kubiëna, [R] 336.
Solution Subsidence Outliers, T. M. Thomas, 220.
Somaliaster Hawkins, The Echinoid, K. A. Joysey, 45.
Stainforth, R. M., Comments on the Caribbean Oligocene, 175.
Strachan, I., A New Graptolite from Canada, 509.
Stress and Transcurrent Faults, H. W. Wellman, 407.
Strollamus Area of Skye, B. C. King, 255.
Sutherland, P. K., New Carboniferous Corals, 361.
Sutton, J., and J. Watson, Ice-Borne Boulders of the Dalradian of Banffshire, 391.

TEAR Faults in Donegal, G. P Leedal and G. P. L. Walker, 116.
Temple, J. T., Hypostome of *Encrinurus variolaris*, 315.
Tertiary Lavas, contact with Torridonian, Sir E. B. Bailey, 105.
Tetra corals, new genera, P. K. Sutherland, 361.
Thomas, T. M., Solution Subsidence Outliers, 220.
Torridonian, relations to Durness Limestone, Sir E. B. Bailey, 73.
Trechmann, C. T., Thrusting in the Durham Permian, 193.
Trueman, Sir A., Coalfields of Great Britain, [R] 331.
Turner, F. J., *see* Williams, H.
Tuttle, O. F., and M. L. Keith, The Granite Problem, 61.
Twinning of calcite in marb'e, R. H. Clark, 121.

ULTRABASIC Body of Unst, Shetland, M. S. Amin, 399.
Usk Monchiquite—A " Pipe Intrusion ", A. H. Cox, 519.

WALKER, G. P. L., and J. V. Ross, A Xenolithic Monchiquite Dyke, 463.
—— *see* Leedal, G. P.
Watson, J., *see* Sutton, J.
Wealden Times, South-East England in, P. Allen, 498.
Welded Tuffs in the Borrowdale Volcanic Series, R. L. Oliver, 473.
Wellman, H. W., Angle between the Principal Horizontal Stress and Transcurrent Faults, 407.
Wells, A. Kingsley, Mugearites and Oligoclase-basalts, 14.
—— M. K., Granophyric Quartz-Dolerite of Centre 2, Ardnamurchan, 293.
Williams, H., F. J. Turner, and C. Gilbert, Petrography, [R] 416.
Williamson, D. H., *see* Phemister, T. C.
Wright, J., Crinoids from Thornton Burn, 167.

XENOLITHIC Monchiquite Dyke, G. P. L. Walker and J. V. Ross, 463.

ZAPHRIPHYLLUM disseptum gen. et sp. nov., 363.